



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

4/21/00

MEMORANDUM

SUBJECT: Response to Public Comments on the Preliminary Risk Assessments for the Organophosphate Pesticide Chlorpyrifos-Methyl

FROM: Stephanie Nguyen, Chemical Review Manager
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Office of Pesticide Programs

TO: OPP Public Docket for Chlorpyrifos-methyl
Docket # 34202

Introduction

This document addresses public comments received in response to EPA's Notice of Availability in the Federal Register (64 FR 193, October 6, 1999) of preliminary risk assessments for chlorpyrifos-methyl.

Chlorpyrifos-Methyl Specific Comments and Responses

A. Response to Comments on the Health Effects Assessment

Chlorpyrifos-Methyl specific comments related to the preliminary health effects assessment were received from the Registrant, Dow AgroSciences and from the Natural Resources Defense Council (NRDC).

The Registrant's comments were addressed during Phase I of the OP pilot process. The responses, along with their comments, have been placed in the OPP docket. The only comments received during the sixty-day public comment period were from the Natural Resources Defense Council. These comments are summarized below, followed by EPA's response.

1. Data Gaps

Comment: The NRDC agrees with EPA's decision to retain the FQPA safety factor for chlorpyrifos-methyl to assure safety to fetuses, infants and children. However, NRDC indicated concern about the number of data gaps on the toxicity of chlorpyrifos-methyl. They say that it is unclear why studies were not submitted for chlorpyrifos-methyl to meet 1984 FIFRA requirements under 40 CFR Subdivision F Guidelines when chlorpyrifos-methyl apparently was not registered until after 1984. They expressed concern that EPA has not moved immediately to revoke or suspend this chemical's registration pending the submission of the minimum data set that is required for registration of an organophosphate insecticide.

Response: Chlorpyrifos-methyl is not subject to reregistration because it was registered after 1984. Consequently, unlike most organophosphates which are subject to reregistration, chlorpyrifos-methyl was not scheduled for a comprehensive data review. When this chemical was fully registered, the Agency considered the data base adequate for registration. As a result of EPA's review of all OPs together, the Agency determine that many of toxicology studies used in the past for assessing the risk of chlorpyrifos-methyl do not meet current standards. (See "FQPA Safety Factor Recommendations for the Organophosphates" dated 8/6/98 and "Chlorpyrifos-Methyl - Toxicology Endpoint Selection - Report of the Hazard Identification Assessment Review Committee" dated 5/17/99 in the OPP Docket.) It should be noted that to account for uncertainties regarding data, EPA used a 1000X uncertainty factor in its risk assessment. The 1000X uncertainty factor is based the Agency retaining the FQPA safety factor of 10X and the use of two 10X uncertainty factors to account for inter- and intra-species variability. The Agency plans to follow the TRAC pilot process before making a final decision on this chemical.

In addition to toxicology data gaps resulting from the re-evaluation of the existing database, on August 18, 1999 (Volume 64, Number 151, Pages 42945-42947) the Agency announced it is requiring registrants of neurotoxic pesticides to conduct acute, subchronic, and developmental neurotoxicity studies and submit the results to EPA. A Data Call-In notice was issued in September, 1999 requiring these data for all neurotoxic pesticides in phases over time. Cholinesterase inhibiting organophosphates are the first group because of their known neurotoxicity. EPA expects to receive the first studies within two years. This Data Call-In program was developed with the advice of the Children's Health Advisory Committee and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Scientific Advisory Panel.

2. Failure to Consider Full Range of Toxicity of Chlorpyrifos-Methyl's Chief Metabolite [3,4,5 TCP]

Comment: TCP is the common metabolite of chlorpyrifos-methyl, chlorpyrifos and triclopyr; therefore, EPA must include in its risk assessment an evaluation of TCP.

Response: The Agency is conducting a re-evaluation of the toxicological significance of TCP (3,5,6-trichloro-2-pyridinol), which is a metabolite, and environmental degradate of chlorpyrifos-methyl, chlorpyrifos, and triclopyr. TCP was removed from the chlorpyrifos tolerance expression in 1993 because available data indicated TCP did not cause cholinesterase inhibition and, given the level at which chlorpyrifos was being regulated for cholinesterase inhibition, was not of toxicological significance relative to chlorpyrifos per se. Toxicity endpoints for chlorpyrifos and chlorpyrifos-methyl, which are organophosphates, are based on cholinesterase inhibition. The Agency is in the process of reviewing and re-examining available information regarding both the toxicity and exposure potential for TCP.

3. Reasonable Certainty of No Harm

Comment: Under FQPA, EPA is to set tolerances to “ensure that there is a reasonable certainty that no harm will result to infants and children from aggregate exposure to the pesticide chemicals residue” (FFDCA Sec. 408 (a) (2)(C)(ii)(I)). The following are specific concerns for the chlorpyrifos-methyl risk assessment under the reasonable certainty of no harm provision of FQPA: Clear communication of risks, population adjusted dose is exceeded, risk to pregnant farm workers, residential exposure from agricultural uses and exposure from non-residential uses. EPA’s continued decision not to incorporate the real life exposure into its OP risk assessments will result in final risk estimates that are inaccurate, unscientific and less than health-protective.

Response: The acute and chronic dietary exposure has been revised resulting in risk estimates that do not exceed EPA’s level of concern for any population subgroups. These revised acute and chronic dietary exposure analyses incorporate: 1) additional processing factors from re-evaluation of the processing data ; 2) cooking factors obtained from the newly submitted open literature studies; and 3) recent policy changes concerning the treatment of blended and non-blended food forms in the dietary analysis (HED SOP 99.6, 8/20/99). Concerning NRDC’s suggestion on simplifying risk communication, EPA has simplified the explanation and characterization of the risk assessment by providing an overview and summary on chlorpyrifos-methyl. The TRAC Policy Number 2, Section III also describes the arguments and the uncertainties in the calculation of a 99.9th percentile dietary risk assessment.

Regarding risk to pregnant farm workers, residential exposure from agricultural uses, and exposure from non-residential uses, it was determined that exposure from residential uses and water is expected to be insignificant due to the use pattern involved (stored grains and inside grain storage facilities). On farm exposure is limited to mixers, loader and applicators. These risks are addressed in the assessment.

As an indication that residential exposure to chlorpyrifos-methyl occurs, NRDC mentioned a poisoning incident that resulted from flea control use. This incident did not occur in the United States. In addition, this use is not registered in this country. If this product were used as a flea control, it would

be unlawful and would be referred to EPA's Office of Enforcement and Compliance Assurance.

The preliminary risk assessments represent the best attempt of the Agency to identify and estimate potential risks. A primary goal of the transparency process, as initiated by the Tolerance Reassessment Advisory Committee (TRAC), is to solicit comments from knowledgeable and interested parties about our processes and procedures in order to improve, correct and refine the assessments. The Agency acknowledges that any agricultural or industrial chemical use may result in secondary exposure for bystanders and to the general public, due to drift, fugitive emissions (emissions not caught by a capture system) and chemicals taken home by workers on contaminated clothing. This issue is currently being addressed by the Agency. The process to address these concerns is more fully described in the response to Comment 6.

While these policy issues are being addressed, EPA intends to complete the risk assessments for the individual OPs. Updates regarding the status of this and other policy issues can be found at the following web site <http://www.epa.gov/oppfead1/trac/science/>.

4. Use of Studies that Prospectively Dose People with Pesticide Poisons

Comment: NRDC applauds the Agency for not using human studies. However, NRDC considers it is unethical to dose individuals with pesticides when there is no expectation of personal health benefits from the pesticide. In addition, they question the ability of studies performed on adult humans to adequately reflect the risk to children and fetuses. Neither EPA nor the companies performing these human pesticide studies have ever submitted an analysis of the statistical power of such studies.

Response: On July 27, 1998 the Agency announced it is deeply concerned about the conduct of pesticide health effects studies on human subjects and that it would consult with its independent Science Advisory Board (SAB) about the application of stringent ethical standards to any such studies. The Agency further stated that no human studies of this type have been used by EPA for any final decisions concerning acceptable levels of pesticide under the new food safety law. Agency officials have stated that no final Agency regulatory determinations will be based on this kind of human study until the Agency has established an approach for consideration of the ethical acceptability of any such study. Although the Agency presented a proposed policy to the SAB in the fall of 1999, the Agency has not yet received the final response and is continuing to work on its approach to these critical ethical questions.

During this period, EPA has continued to work through its risk assessment revisions and refinements for the organophosphates, including chlorpyrifos-methyl, following the pilot process for public participation in risk assessment and risk management.

For chlorpyrifos-methyl, all risk assessments used only animal toxicity endpoints. Office of Pesticide Programs (OPP) expects to reevaluate this analysis pursuant to the Agency's decisions about

how to consider the ethical acceptability of human studies and in light of on-going efforts to develop peer-reviewed guidance for the scientific evaluation of any human studies determined to be ethically-appropriate for consideration in pesticide risk assessments.

5. Comment Related to Aggregate Exposure

Comment: EPA has stated that an aggregate risk estimate is not required for chlorpyrifos-methyl, because drinking water and residential exposures to chlorpyrifos-methyl are not anticipated. NRDC strongly disagrees with EPA's approach. FQPA required that assessment of aggregate exposure through all dietary and non-dietary, non-occupational sources be completed, so as to provide a reasonable certainty of no harm.

Response: In the case of chlorpyrifos-methyl, performing an aggregate risk assessment when drinking water and residential exposures are not expected would change the risk estimates presented in the preliminary risk assessment where only exposure to treated food was considered.

The Agency has continued with development of additional guidance on its approach to assessing aggregate risk, and draft policy documents were issued for public comment in January 1999, with additional policy documents concerning the Agency's approach to drinking water assessment expected this year. Revised policy and guidance, which considers public comments received, will follow. The approach to residential exposure and risk assessment was discussed at the SAP in September 1999. See also the Federal Register Notice of October 29, 1998 regarding the science policy papers, and the OPP web site at:

<http://www.epa.gov/fedrgstr/EPA-PEST/1999/November/Day-10/6043.pdf>.

6. Occupational and "Take-Home" Risks.

Comment: Under the health-protective provisions of FQPA, EPA's risk assessments for the organophosphates must account for risks to both the fetuses of pregnant workers, and the families of workers taking pesticide residues home with them.

Response: The chlorpyrifos-methyl risk assessment reflects the Agency's current approaches for completing residential exposure assessments, based on guidance provided in the *Draft: Series 875-Occupational and Residential Exposure Test Guidelines, Group B-Postapplication Exposure Monitoring Test Guidelines (7/24/97 Version)*, the *Draft: Standard Operating Procedures (SOPs) for Residential Exposure Assessment (12/11/97 Version)*, and the *Overview of Issues Related to the Standard Operating Procedures for Residential Exposure Assessment* presented at the September 1999 meeting of the FIFRA (SAP). The Agency is, however, currently in the process of revising its guidance for completing these types of assessments. Modifications to this assessment shall be incorporated as updated guidance becomes available. This will include expanding the scope of residential exposure assessments by developing guidance for characterizing exposures from other

sources not already addressed, such as spray drift; residential residue track-in; exposure to farm worker children; and exposure to children in schools.

7. Cumulative Risks Assessment/Cumulative Risks to Workers and Worker's Families.

Comments: The NRDC contends that EPA has not met its public health responsibility nor the FQPA mandate by not including cumulative risk estimates for the OPs. OPs are known to have a common mechanism of human neurotoxicity through inhibition of the enzyme cholinesterase. EPA must consider cumulative exposures to the children of those handling pesticides resulting from take-home exposure on clothing, skin, hair, and equipment stored in the house.

Response: EPA agrees that based on current scientific information, organophosphate pesticides should be considered as operating via a common mechanism of toxicity—cholinesterase inhibition. In the Federal Register of August 6, 1998 (63 FR 42031 (FRL-5797-9)), EPA issued a notice announcing the availability of the proposed EPA pesticide policy guidance document entitled "Guidance for Identifying Pesticide Chemicals That Have a Common Mechanism of Toxicity for Use in Assessing the Cumulative Toxic Effects of Pesticides." In developing this document, the Agency solicited advice from the FIFRA SAP in February 1997; a year later (March 1998), OPP reported its progress to the SAP. The guidance document describes the approach that EPA proposes to use for identifying and categorizing pesticide chemicals that have a common mechanism of toxicity for purposes of assessing the cumulative toxic effects of such pesticides. The 60-day comment period ended October 8, 1998. Revised guidance was issued in February, 1999 and was one subject of discussion at the SAP held in September 1999.

With respect to the comment that EPA has not considered common mechanism in these early assessments, the Agency acknowledges that it has not yet performed a cumulative risk assessment, because the methodology for conducting such assessments is still being developed. Since there are currently no standard methods for doing cumulative risk assessment, EPA is pursuing an open, peer-reviewed process to develop approaches to cumulative risk assessment. The Agency is also nearing completion of the revision of the Chemical Mixtures Risk Assessment Guidelines, which present methods for combining risks from multiple chemicals. In addition, the International Life Sciences Institute (ILSI) is independently exploring appropriate methods and developing a framework for performing a cumulative risk assessment. ILSI held a workshop on this subject in September 1998, and the results of this work has been considered by the Agency (see "Guidance for Identifying Pesticide Chemicals That Have a Common Mechanism of Toxicity for Use in Assessing the Cumulative Toxic Effects of Pesticides"). The Agency will continue its ongoing efforts in this area along with examining the ILSI work and other sources of information, in preparation for release of an Agency draft guidance document. Cumulative risk assessment methodology issues for pesticides that have a common mechanism of toxicity was a topic at the December 8, 1999 SAP meeting.

Until the methodology is finalized, EPA intends to complete risk assessments for individual OPs and proceed with the public process for development of risk mitigation strategies. The Agency will soon issue for public comment a draft of its assessment policy for organophosphate pesticides. Updates regarding the status of this and other policy issues can be found on the OPP web site.

It should be noted that the NRDC has previously petitioned the Agency to designate farm children as a major identifiable subgroup under the FQPA. The Agency is currently evaluating the scientific and legal issues raised in that petition. EPA acknowledges that exposures to farm worker children were not evaluated separately, i.e., as a distinct population sub-group. However, based on the limited data currently available to characterize actual pesticide exposure to children of agricultural workers, such as a 1997 biomonitoring study by Loewenherz, Fenske and others (Environ. Health Perspect. 105:1344-1353), we believe that exposure estimates developed by EPA, using the Agency's Residential Exposure SOPs and other available information, are reasonably inclusive of exposures likely to be experienced by this sub-group. Nevertheless, EPA is concerned about the disproportionate exposure of farm children to pesticides and has several ongoing projects discussed below, designed to both assess and reduce these exposures.

EPA's major external research program, the Science to Achieve Results (STAR) program, allocated funds in fiscal year 1996 for three years of research on the most urgent issues regarding exposure of children to pesticides. The studies are looking at major types of exposure (touching, eating, crawling, etc.) and at seasonal and locational differences, including agricultural settings. This research will support regulations and public education efforts that are more fully protective of children, including revised use restrictions and labeling requirements, and improved training and public information materials. Under the STAR program, the University of Arizona is assessing exposure of the children of seasonal and migrant laborers to agricultural pesticides. In addition, the University of Washington is assessing, on a comprehensive seasonal basis, children's exposures to organophosphate pesticides.

EPA's National Center for Environmental Research and Quality Assurance of the Office of Research and Development is funding a grant with the University of California at Berkeley for a five-year study, which began in August 1998, to quantify the exposure of children in agricultural areas of California to pesticides. The project will integrate biological research with community-based intervention efforts. The study will determine the impacts of pesticide exposure on children's growth and development. The University will also work with the farm worker community to investigate approaches for reducing these exposures.

Finally, based on recommendations from the Children's Health Protection Advisory Committee (CHPAC), EPA has committed to conduct a national assessment of implementation and enforcement of the Worker Protection Standard, including its effectiveness in addressing safety needs of women and children as agricultural workers.